

STATUS OF CLAIMS

1. Canceled.
2. (Currently amended.) ~~The method of claim 1,~~ A method for designing a progressive addition lens, comprising a.) describing a progressive addition surface; and b.) optimizing the surface using a merit function of the formula:

$$\underline{MF = MF_{\text{blur}} + MF_{\text{power}} + MF_{\text{other}}}$$

wherein:

MF_{blur} is a merit function that controls image blur;

MF_{power} is a merit function that controls the mean sphere power; and

MF_{other} is a merit function that controls constraints on cosmetics and manufacturability wherein the surface is described as a continuous, a differentially continuous, or a twice differentially continuous surface.

3. (Currently amended.) The method of claim 2, wherein the surface is described according to the equation:

$$\text{sag}_{x,y} = \text{Delta}_{x,y} + \frac{c \cdot r^2}{1 + \left[1 - (1 + k) \cdot c^2 \cdot r^2 \right]} + \alpha_1 \cdot r^2 + \alpha_2 \cdot r^4 + \alpha_3 \cdot r^6 + \alpha_4 \cdot r^8 + \dots$$

wherein:

c is a surface curvature;

r is a radial distance from an optical axis of the lens;

k is a conic constant;

$\alpha_1, \alpha_2, \alpha_3, \alpha_4$ each are a coefficient; and

$\text{Delta}_{x,y}$ is a delta sag that is a function of x and y.

4. Canceled.
5. Canceled.

6. Canceled.

7. (Original) A method for designing a progressive addition lens, comprising a.) describing at least two progressive addition surfaces; and b.) optimizing the surfaces using merit functions of the formula:

$$MF = MF_{\text{blur}} + MF_{\text{power}} + MF_{\text{other}}$$

wherein:

MF_{blur} is a merit function that controls image blur;

MF_{power} is a merit function that controls the mean sphere power; and

MF_{other} is a merit function that controls constraints on cosmetics and manufacturability.

8. (Original) The method of claim 7, wherein the surfaces are each independently described as a continuous, a differentially continuous, or a twice differentially continuous surface.

9. (Original) The method of claim 7, wherein the surfaces are each described according to the equation:

$$\text{sag}_{x,y} = \text{Delta}_{x,y} + \frac{c \cdot r^2}{1 + \left[1 - (1 + k) \cdot c^2 \cdot r^2 \right]} + \alpha_1 \cdot r^2 + \alpha_2 \cdot r^4 + \alpha_3 \cdot r^6 + \alpha_4 \cdot r^8 + \dots$$

wherein:

c is a surface curvature;

r is a radial distance from an optical axis of the lens;

k is a conic constant;

$\alpha_1, \alpha_2, \alpha_3, \alpha_4$ each are a coefficient; and

$\text{Delta}_{x,y}$ is a delta sag that is a function of x and y .

10. (Original) The method of claim 7, 8, or 9, wherein MF_{power} is :

$$MF_{power} = \sum_{\theta_x} \sum_{\theta_y} W_{\Phi_{\theta_x, \theta_y}} \left(\Phi_{\theta_x, \theta_y} - P_{\theta_x, \theta_y} \right)^2 + W_{add_{\theta_x, \theta_y}} \left[\left(AddF_{\theta_x, \theta_y} - PF_{\theta_x, \theta_y} \right)^2 + \left(AddB_{\theta_x, \theta_y} - PB_{\theta_x, \theta_y} \right)^2 \right]$$

wherein

θ_x is a horizontal eye rotation angle;

θ_y is a vertical eye rotation angle;

RMS_{θ_x, θ_y} is a RMS spot size calculated at an image of an eye lens;

$W_{rms_{\theta_x, \theta_y}}$ is a weight for a field position;

$AddF_{\theta_x, \theta_y}$ is a calculated add power on a front surface of the lens;

$AddB_{\theta_x, \theta_y}$ is a calculated add power on a back surface of the lens;

PF_{θ_x, θ_y} is a target for an add power value for the front surface;

PB_{θ_x, θ_y} is a target for an add power for the back surface; and

$W_{add_{\theta_x, \theta_y}}$ is a weighting.

11. (Original) The method of claim 7, 8, or 9, wherein MF_{power} is :

$$MF_{power} = W_{add_{far}} \left[\left(AddF_{far} - PF_{far} \right)^2 + \left(AddB_{far} - PB_{far} \right)^2 \right] + \left[\sum_{\theta_x} \sum_{\theta_y} W_{\Phi_{\theta_x, \theta_y}} \left(\Phi_{\theta_x, \theta_y} - P_{\theta_x, \theta_y} \right)^2 \right]$$

wherein

θ_x is a horizontal eye rotation angle;

θ_y is a vertical eye rotation angle;

RMS_{θ_x, θ_y} is a RMS spot size calculated at an image of an eye lens;

$W_{rms_{\theta_x, \theta_y}}$ is a weight for a field position;

$AddF_{\theta_x, \theta_y}$ is a calculated add power on a front surface of the lens;

$AddB_{\theta_x, \theta_y}$ is a calculated add power on a back surface of the lens;

PF_{θ_x, θ_y} is a target for an add power value for the front surface;

PB_{θ_x, θ_y} is a target for an add power for the back surface; and

$W_{add_{\theta_x, \theta_y}}$ is a weighting.

12. (Original) The method of claim 7, 8, or 9, wherein MF_{blur} is:

$$MF_{\text{blur}} = \sum_{\theta_x} \sum_{\theta_y} \left[W_{\text{rms}}_{\theta_x, \theta_y} \cdot \left(\text{RMS}_{\theta_x, \theta_y} \right)^2 + W_{\text{ast}}_{\theta_x, \theta_y} \cdot \left(\text{AstF}_{\theta_x, \theta_y} - \text{AF}_{\theta_x, \theta_y} \right)^2 \right] \quad (\text{IX})$$

wherein:

$\text{AstF}_{\theta_x, \theta_y}$ is either the surface astigmatism from the front surface or the contribution to the total lens astigmatism as seen by the eye from the front surface; and

$W_{\text{ast}}_{\theta_x, \theta_y}$ are the weights placed on the unwanted astigmatism.

13. (Original) The method of claim 10, wherein MF_{blur} is:

$$MF_{\text{blur}} = \sum_{\theta_x} \sum_{\theta_y} \left[W_{\text{rms}}_{\theta_x, \theta_y} \cdot \left(\text{RMS}_{\theta_x, \theta_y} \right)^2 + W_{\text{ast}}_{\theta_x, \theta_y} \cdot \left(\text{AstF}_{\theta_x, \theta_y} - \text{AF}_{\theta_x, \theta_y} \right)^2 \right] \quad (\text{IX})$$

wherein:

$\text{AstF}_{\theta_x, \theta_y}$ is either the surface astigmatism from the front surface or the contribution to the total lens astigmatism as seen by the eye from the front surface; and

$W_{\text{ast}}_{\theta_x, \theta_y}$ are the weights placed on the unwanted astigmatism.

14. (Original) The method of claim 11, wherein MF_{blur} is:

$$MF_{\text{blur}} = \sum_{\theta_x} \sum_{\theta_y} \left[W_{\text{rms}}_{\theta_x, \theta_y} \cdot \left(\text{RMS}_{\theta_x, \theta_y} \right)^2 + W_{\text{ast}}_{\theta_x, \theta_y} \cdot \left(\text{AstF}_{\theta_x, \theta_y} - \text{AF}_{\theta_x, \theta_y} \right)^2 \right] \quad (\text{IX})$$

wherein:

$\text{AstF}_{\theta_x, \theta_y}$ is either the surface astigmatism from the front surface or the contribution to the total lens astigmatism as seen by the eye from the front surface; and

$W_{\text{ast}}_{\theta_x, \theta_y}$ are the weights placed on the unwanted astigmatism.

15. (Currently amended.) The method of claim ~~1-6~~ 7, further comprising c.) determining a set of coefficients to describe the lens surface to minimize the value of the merit function.

16. (Original) The method of claim 15, wherein step c.) is carried out by (i) selecting optimization variables that are a curve for a front surface and a curve for the back surface of the lens; and (ii) minimizing MF_{other} .

17. Canceled.

18. Canceled.

19. Canceled.

REMARKS

Reconsideration of the application in view of the foregoing amendments and following remarks is respectfully requested. The Examiner indicated that claims 7 through 14 were allowed. Claims 2, 3, and 16 were objected to as being dependent on a rejected base claim. The claims are hereby amended to overcome the objection and withdrawal of the objection as to claims 2, 3, and 16 is respectfully requested.

Applicants submit that, as amended, the claims are in condition for allowance. Entry of the amendments and allowance of the claims is respectfully requested.

Respectfully submitted,
/Lois A. Gianneschi/

Date: February 10, 2005
Johnson & Johnson
Law Department
One Johnson & Johnson Plaza
New Brunswick, NJ 08933
732-524-6351

Attorney for Applicants
Reg. No. 35,519